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(54) **IMPLANT WITH SUSPENDED LOCKING HOLES**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

23,409 A * 3/1859 Thom F16B 25/00 411/411
3,695,259 A 10/1972 Yost
4,838,252 A 6/1989 Klaue
5,002,544 A * 3/1991 Klaue A61B 17/80 606/280
5,015,248 A 5/1991 Burstein et al.
5,022,277 A * 6/1991 Shaffer F16H 25/2233 74/424.9
5,053,036 A 10/1991 Perren et al.
5,151,103 A 9/1992 Tepic et al.
5,474,553 A 12/1995 Baumgart
5,616,144 A * 4/1997 Yapp A61B 17/7059 606/280
5,702,396 A 12/1997 Hoenig et al.
5,709,686 A 1/1998 Talos et al.
5,733,287 A * 3/1998 Tepic et al. 606/69
5,741,258 A 4/1998 Klaue et al.
5,741,259 A 4/1998 Chan
5,749,872 A 5/1998 Kyle et al.
5,772,662 A * 6/1998 Chapman A61B 17/72 606/280

(Continued)

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(57) **ABSTRACT**

A plate is provided with feet located laterally of adjacent compression screw holes and absent from about threaded locking holes so as to suspend the plate segment having the threaded locking holes from over the bone. This forces a minimum gap between the threaded holes and the bone, and allows the plate thereat to deflect under loads that can be practically delivered by the locking screws. By allowing the plate to deflect, the threads on the head of the locking screw can be aligned, or timed, with the threads of the threaded plate hole to reduce the required torque to insert the locking screw into the locking hole and the bone.

20 Claims, 4 Drawing Sheets